



BUGNION S.p.A. - Consulenza in Proprietà Industriale

Filiale di Bologna:
Via Goito, 18 - 40126 Bologna (Italia)
Tel. 051 6583311 - Fax 051 6583400
E-mail: bologna@bugnion.it

Giuseppe Righetti •▲
Paolo Bellomia •
Marco Benedetto •
Ezio Bianciardi •
Alfonso Colli •
Franco De Berardinis •
Sergio Di Curzio •
C. Raoul Ghioni •▲
Alberto Gianelli •
Stefano Gotra •▲
Luciano Lanzoni •▲
Rossella Masetti •
Luciano Neri •
Paolo Pederzini •▲
Marco Ponzellini •▲
Donatella Prandin •
Renata Righetti •
Gino Ruffini •
Gino Salvadori •
Ivo Schwarzer •
Fabrizio Tansini •▲

Giuseppina Albricci •
Elena Andreolli •
Matteo Baroni •
Vittorio Bongiovanni •
Marco Brasca •
Giovanni Casadei •
Giulio Conti •
Marco Conti •
Silvia Cudia •
Paolo Di Mella •
Luciana Fangareggi •
Valeriano Fanzini •▲
Leonardo Firmati •
Davide Follador •
Elisa Franchina •
Alessandro Galassi •▲
Francesco Galise •
Federico Gnesini •
Elena Grigolo •
Simona Inchingalo •
Marco Lissandrini •
Guido Maffei •
Roberto Margutti •
Alberto Monelli •
Antonio Nesti •
Giro Palestini •
Marco Paolizzi •
Aldo Paparo •
Laura Pellicani •
Simone Ponchioli •▲
Tommaso Puggioli •
Matteo Scaglietti •
Marco Sgobba •
Fabio Simoni •
Luigi Tarabbia •
Francesco Terrano •
Simone Verducci Galletti •

- Consulente in proprietà industriale
- Consulente brevetti
- ▲ Consulente brevetti europeo
- ◆ Consulente marchi

Uffici a:
Bologna, Bolzano, Brescia,
Milano, Modena, Parma,
Reggio Emilia, Rimini,
Roma, Udine, Varese, Verona

Recapiti a:
Perugia, Pescara, Piacenza,
Senigallia

Messrs.
EUROPEAN PATENT OFFICE
as **PCT IPEA**
D-80298 MÜNCHEN
GERMANY

Attn. Mr. WARTENHORST, F.
Authorized Officer

Our Ref: A3232.WO.209

Your ref:

Bologna, 13 May 2005

Re: International Patent Application No. PCT/IB2004/002330 filed on 15 July 2004 in the name of AZIONARIA COSTRUZIONI MACCHINE AUTOMATICHE A.C.M.A. S.p.A. et al.

Dear Sir,

reference is made to the above identified Patent Application and to the Written Opinion (Form PCT/ISA/237) received with Form PCT/ISA/220 dated 29/09/2004.

The following document has been applied by the Examiner:

D1) US 4 535 583

The Examiner objected to claim 1 as lacking novelty over document D1; objected to claims 2-4 and 6 as lacking inventive step.

AMENDMENTS

The Examiner's objections and references cited have been carefully considered.

A new set of claims has been drafted in order to meet the requirements of Article 33(1) PCT.

According to the Examiner's suggestion, independent claim 1 has been amended introducing the subject matter of original claims 2-5.
Consequently, original claims 2-5 have been cancelled.

Sede Legale:

V.le Lancetti, 19 - 20158 Milano (Italia) - www.bugnion.it - Cap. Soc. i. v. € 600.000 - REA 780133 - Reg. Imp. MI. e C.F. 00850400151 - P. IVA IT-00850400151

Original claims 6 to 17 have been renumbered and, where necessary, amended in their dependencies.

Please note that, at point 4 of the present written opinion, the Examiner asserts that "the combination of the features of dependent claim 5 is neither known from, nor rendered obvious by, the available prior art".

For this reason, amended claim 1 is considered allowable over the cited prior art.

ARTICLE 33(2) PCT – NOVELTY

Independent claim 1 now recites: *"A capping unit for closing containers (2) with respective caps (3), of the type comprising: a carrier and conveyor component (5) on which to advance the containers (2) and the relative caps (3); a motor (6) associated with the carrier and conveyor component (5), by which the selfsame component (5) is set in rotation about a respective primary axis (5a); a plurality of capping assemblies (11) associated with the carrier component (5), each positioned above a corresponding container (2) and capable of movement vertically between a first position, distanced from the respective container (2), and a second position actively engaging the container, wherein each capping assembly (11) presents a gripping mechanism (17) such as can be associated with a relative cap (3) when the corresponding capping assembly (11) is in the second position, and the gripping mechanism (17) is rotatable in such a way as to screw the cap (3) onto a threaded neck (4) of the respective container (2) about a respective secondary axis (17a); characterized in that it further comprises first drive means (14) presenting a plurality of primary electric motors (14a), each one of which associated with a respective capping assembly (11) by which the single capping assemblies (11) can be set in motion vertically, one independently of another; second drive means (18) presenting a plurality of secondary electric motors (18a), each one of which associated with a respective gripping mechanism (17) by which the single gripping mechanisms (17) can be set in rotation one independently of another; and an electronic controller device (40) connected to each of the primary electric motors (14a) and the secondary electric motors (18a); characterized in that it further comprises a processing block (41) by means of which to vary the operating parameters of each primary electric motor (14a) and each secondary electric motor (18a) according to the dimensions of the respective containers (2)"*

Document D1 shows (the references in parenthesis applying to D1): a capping unit comprising a conveyor (10), a motor (8), capping assemblies provided with gripping mechanisms (13), primary drive means (15, 16) setting a capping assembly in vertical motion and secondary drive means (12) setting a gripping mechanism in rotational motion.

Document D1 does not show electric motors and a processing block to vary the operating parameters of the electric motors according to the dimension of the respective containers.

Therefore the subject matter of amended claim 1 is clearly new over the prior art.

ARTICLE 33(3) PCT – INVENTIVE STEP

D1 is the document that performs substantially the same function and has much features in common with present claim 1 so it is considered the closest prior art.

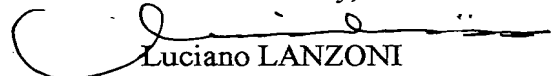
Amended claim 1 faces the objective technical problem of providing a capping unit adaptable to the containers of different sizes.

Indeed, the processing block (41) is capable to vary the operating parameters of each primary electric motor (14a) and each secondary electric motor (18a) according to the dimensions of the respective containers (2). As a consequence it is possible to close containers of different sizes.

Document D1 does not solve the above cited technical problem.

Since the solution claimed by amended claim 1 to the stated objective technical problem is not shown nor suggested by any of the prior art references, it is felt that new claim 1 involves an inventive step over the prior art.

Yours faithfully,



Luciano LANZONI
c/o BUGNION S.p.A.

Enclosures:

- replacement sheets (Rule 66.8 PCT): pages 20 - 25;
- Working copy of amended pages: 20 - 25.

Claims

1) A capping unit for closing containers (2) with
respective caps (3), of the type comprising: a
carrier and conveyor component (5) on which to
5 advance the containers (2) and the relative caps (3);
a motor (6) associated with the carrier and conveyor
component (5), by which the selfsame component (5) is
set in rotation about a respective primary axis (5a);
a plurality of capping assemblies (11) associated
10 with the carrier component (5), each positioned above
a corresponding container (2) and capable of movement
vertically between a first position, distanced from
the respective container (2), and a second position
actively engaging the container, wherein each capping
15 assembly (11) presents a gripping mechanism (17) such
as can be associated with a relative cap (3) when the
corresponding capping assembly (11) is in the second
position, and the gripping mechanism (17) is
rotatable in such a way as to screw the cap (3) onto
20 a threaded neck (4) of the respective container (2)
about a respective secondary axis (17a);
~~characterized in that it further comprises~~ first
drive means (14) presenting a plurality of primary
electric motors (14a), each one of which associated
25 with a respective capping assembly (11) by which the
single capping assemblies (11) can be set in motion
vertically, one independently of another; second
drive means (18) presenting a plurality of secondary
electric motors (18a), each one of which associated

with a respective gripping mechanism (17) by which the single gripping mechanisms (17) can be set in rotation one independently of another; and an electronic controller device (40) connected to each
5 of the primary electric motors (14a) and the secondary electric motors (18a); characterized in that it further comprises a processing block (41) by means of which to vary the operating parameters of each primary electric motor (14a) and each secondary
10 electric motor (18a) according to the dimensions of the respective containers (2).

~~2) A unit as in claim 1, wherein the first drive means (14) comprise a plurality of primary electric motors (14a), each one of which associated with a
15 respective capping assembly (11).~~

~~3) A unit as in claim 1, wherein the second drive means (18) comprise a plurality of secondary electric motors (18a), each one of which associated with a
respective gripping mechanism (17).~~

~~4) A unit as in claims 2 and 3, further comprising an electronic controller device (40) connected to each of the primary electric motors (14a) and the
20 secondary electric motors (18a).~~

~~5) A unit as in claim 4, wherein the electronic controller device (40) comprises a processing block
25 (41) by means of which to vary the operating~~

~~parameters of each primary electric motor (14a) and each secondary electric motor (18a) according to the dimensions of the respective containers (2).~~

6 2) A unit as in claims ~~2 and 3~~ 1, wherein the carrier component (5) comprises:

- a drum (8) associated with the motor (6) and rotatable about the primary axis (5a);
- a base (9) associated with the bottom of the drum (8), on which to stand the containers (2);
- 10 - a platform (10), associated with the top of the drum (8) and facing the base (9), to which the capping assemblies (11) are mounted in a circumferential formation.

7 3) A unit as in claim 6 2, wherein each capping
15 assembly (11) comprises a rod (12) inserted slidably through a relative guide (13) afforded by the platform (10), extending longitudinally in coaxial alignment with the secondary axis (17a) and presenting a first end (12a) with which the
20 respective gripping mechanism (17) is associated, and a second end (12b) opposite to the first end (12a).

8 4) A unit as in claim 7 3, wherein each primary electric motor (14a) occupies a position coinciding with the second end (12b) of the rod (12) and above
25 the platform (10).

9 5)A unit as in claim 4 8, wherein each primary electric motor (14a) comprises a shaft (15) rotatable about a respective axis perpendicular to the secondary axis (17a), and a gear (15a) keyed to the shaft (15).

10 10 6)A unit as in claim 9 5, wherein each rod (12) presents a rack (16) extending longitudinally along the respective second end (12b) and engaged in meshing contact by the gear (15a) of each primary electric motor (14a), in such a way that the rod (12) can be set in motion vertically by rotation of the gear (15a).

15 11 7)A unit as in claims 7 3 to 10 6, wherein each secondary electric motor (18a) is mounted between the first end (12a) of the corresponding rod (12) and the gripping mechanism (17) and presents a shaft (19) rotatable about an axis parallel to the secondary axis (17a).

20 12 8)A unit as in claim 11 7, wherein the gripping mechanism (17) comprises:

25 - a gripper (20) attached to the shaft (19) of the respective secondary electric motor (18a), capable of movement between an open condition in which the relative capping assembly (11) is in the first position and a closed condition in which the relative capping assembly (11) is in the second position with the gripper (20) engaging the relative cap (3);

- an actuator (25) by which the gripper (20) is caused to alternate between the open and closed conditions;

5 - a transmission component (31) interposed between the gripper (20) and the actuator (25), by which motion is relayed from the actuator (25) to the gripper (20).

13 9) A unit as in claim 12 8, wherein the gripper (20) comprises:

10 - a carrier element (21) of substantially cylindrical appearance, associated coaxially with the shaft (19) of the secondary electric motor (18a);

15 - a plurality of jaws (22) hinged circumferentially to the cylindrical carrier element (21) and capable of movement between a position drawn toward one another, corresponding to the closed condition of the gripper (20), and a position spread apart from one another, corresponding to the open condition of the gripper (20).

20 14 10) A unit as in claim 13 9, wherein each jaw (22) presents a substantially curved appearance and is identifiable as having a first end (22a) furnished with a following roller (23), a second end (22b) opposite to the first end (22a), furnished with a
25 contact element (24) designed to engage the cap (3), and an intermediate portion (22c) disposed between the first end (22a) and the second end (22b) and hinged to carrier element (21).

15 11)A unit as in claim 12 8, wherein each
transmission component (31) comprises a plunger (32)
of substantially frustoconical geometry coaxially
encircling and slidable along the shaft (19) of the
.5 secondary electric motor (18a), and a mechanical
linkage (33) coupled rigidly to the plunger (32).

16 12)A unit as in claim 15 11, wherein the plunger
(32) presents a downwardly tapering outer surface
(32c), and the following roller (23) of each jaw (22)
10 rolls vertically on the selfsame external surface
(32c).

17 13)A unit as in claim 15 11, wherein the actuator
(25) is a linear actuator coupled to the mechanical
linkage (33) in such a way as to induce a vertical
15 movement of the plunger (32).